

## Significant Additions to the Butterflies of the Trinity Alps and Mount Eddy, Northern California

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The Trinity Alps and Trinity Divide, including Mount Eddy, are situated in northwestern California and provide high-montane, sub-alpine and alpine environments of granitic, metamorphic, and ultrabasic substrates far removed from the Sierra Nevada and thus of considerable biogeographic interest. The butterfly faunistics and ecology of the region were investigated by Shapiro, Palm and Wcislo (1981), (Shapiro, A. M., C. A. Palm & K. L. Wcislo. 1981. The ecology and biogeography of the Trinity Alps and Mount Eddy, northern California, *J. Res. Lepid.* 18: 69-152), who based on five years' field work reported 115 species. Despite frequent visits in the subsequent eight field seasons, only one additional species has been recorded. However, of the hundreds of additional records and the twenty-five or thirty new collection sites, a number are of special interest and bear on our understanding of the biogeography of the region. This paper reports the most important of the new information gathered since 1980. It is intended to be used with Shapiro, Palm and Wcislo (1981). New locality and capture data are presented by species; page numbers refer to the original text.

The following are the most significant of the new localities, presented in the format of Appendix I (pp. 145-147). The 15' topographical maps on which they can be found are BK — Bonanza King and D — Dunsmuir. Since 1981 a large number of new 7.5' quadrangles have appeared, so most of the study area is now mapped on a much finer scale. The 7.5' quadrangles are also identified for the new localities.

Asbestos Gulch: 4 km SW Horse Heaven Meadows; hillside seep with tufa deposits, unusual vegetation (discussed below); Trinity Divide: 1603 m. (Seven Lakes Basin 7.5')

Crow Creek: *Darlingtonia* bog near jet. Crow Creek and E Fork Trinity River, 1220 m. (Mumbo Basin 7.5') BK

Horse Flat Camp: Lower montane mixed forest, 5.3 km up Eagle Creek from trailhead, 1450 m. BK

Horse Heaven Meadows: *Ledum* bog, Castle Creek Road at E Fork Trinity River below Grey Rocks, 1.6 km W Whalen Summit, 1767 m. (Seven Lakes Basin 7.5') D

### Additions to Annotated List of Species

2. *Oeneis nevadensis* Felder and Felder. (p. 92)

RECORDS: Horse Heaven Meadows, 21.VI.86.

4. *Cercyonis pegala boopis* Behr. (p. 93)

RECORDS: Deadfall Meadow, 22.VI.86.

21. *Phyciodes orseis orseis* Edwards. (p. 99)

RECORDS: Horse Heaven Meadows, 21.VI.86; Deadfall Meadow (3), 22.VI.1986.

33. *Precis coenia* Hbn. (p. 103)

RECORDS: Horse Heaven Meadows, 21.VI.86.

34. *Limenitis lorquini* Bdv. (p. 103)

RECORDS: Horse Heaven Meadows, 22.VI.86.

37. *Lycaena arota* Bdv. (p. 104)

RECORDS: Horse Heaven Meadows, 5.IX.87.

41. *Lycaena mariposa* Reak. (p. 106)

RECORDS: Horse Heaven Meadows, 21.VI.86, 5.IX.87.

49A. *Mitoura johnsoni* Skinner. Johnson's Hairstreak.

The only additional species from the region, a large female collected from flowers of *Ledum glandulosum* Nutt. var. *californicum* (Kell.) Hitchc.

RECORDS: Horse Heaven Meadows, 21.VI.86.

54. *Callophrys lemberti* Tilden. (p. 111)

RECORDS: Mount Eddy summit, 18.VI.89.

57. *Glaucopsyche piasus* Bdv. (p. 112)

RECORDS: Coffee Creek, 1000m, 20.VI.89; Horse Flat Camp, 21.VI.89; Deadfall Meadow (4), 22.VI.1986.

66. *Agriades glandon* Prunner. (p. 115)

RECORDS: Horse Heaven Meadows, 21.VI.86; Crow Creek, 21.VI.86.

71. *Neophasia menapia* Feld. & Feld. (p. 117)

RECORDS: Horse Heaven Meadows, 5.IX.87.

88A. *Euphyes vestris* Bdv. (p. 123)

RECORDS: Crow Creek (4), 21.VI.1986.

94. *Hesperia harpalus* Edwards (*H. "comma complex"*) (p. 124)

As noted in the original text, Trinity-Eddy populations are extraordinarily variable. On 5.IX.1987 a series of 70 specimens (29 ♀, 41 ♂) was taken on the tufa exposure near Asbestos Gulch in the Trinity Divide. This represented a small fraction of the number of animals flying in the densest population of this complex I have ever seen outside high desert. The variability was extreme, even for this region. A sample is illustrated in figs. 1 and 2. The most extensively-marked males were strongly reminiscent of *H. lindseyi* Holland. All of the animals, along with *Polites sabuleti* Bdv. and *Hesperia juba* Scudder, were visiting flowers of a dwarfed ecotype of rabbitbrush, *Chrysothamnus nauseosus* (Pall.) Brit. which was the aspect dominant on the site. Associated with it were *Cirsium breweri* (Gray) Jeps. (mostly already setting seed) and *Triglochin maritima* L., both strongly calciphilic and the latter very local inland.

100. *Carterocephalus palaemon* Pallas. (p. 126)

RECORDS: Horse Heaven Meadows, 21.VI.86.

104. *Erynnis icelus* Scud. & Burg. (p. 127)

RECORDS: Horse Flat Camp, 21.VI.89; Horse Heaven Meadows, 21.VI.86.

107. *Erynnis persius* Scudder. (p. 128)

RECORDS: Horse Heaven Meadows, 5.IX.87.

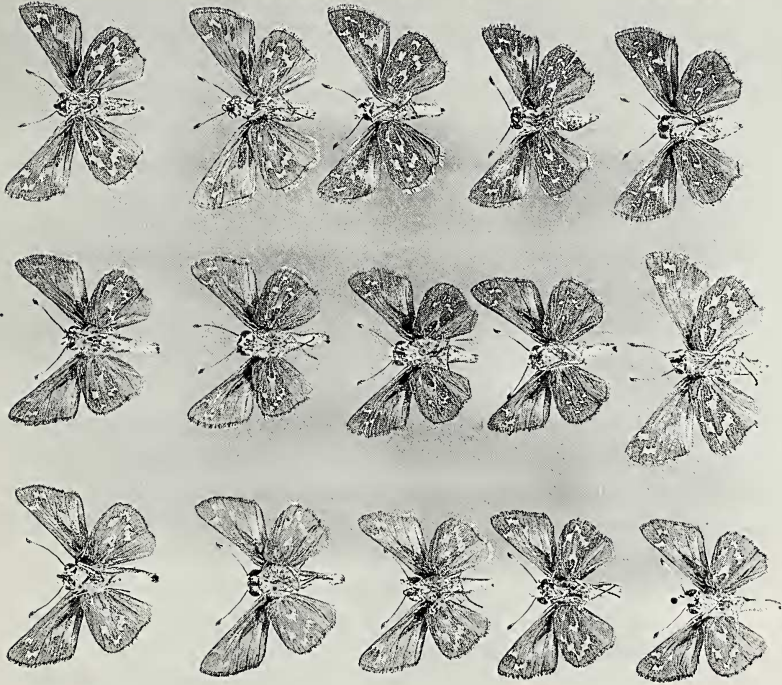


Fig. 2. Ventral Surfaces of some *Hesperia* "comma complex" collected near Asbestos Gulch, Trinity Co., 5.IX.1987 (not the same individuals as fig. 1).

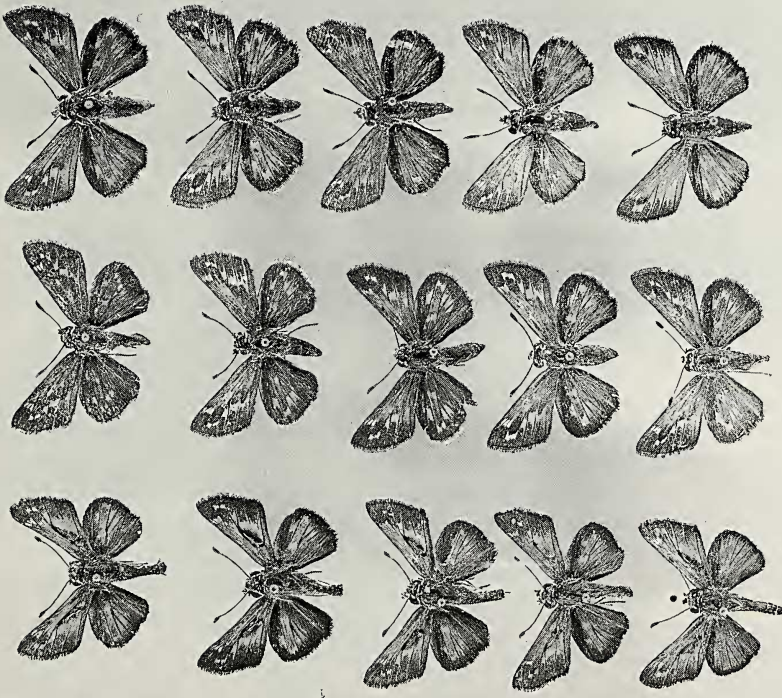


Fig. 1. Dorsal surfaces of some *Hesperia* "comma complex" collected near Asbestos Gulch, Trinity Co., 5.IX.1987.

## Discussion

Most of the Horse Heaven Meadows records represent either first collections or significant range extensions within the Trinity Divide, which has been rather poorly documented except for Mount Eddy and Deadfall Meadow. Most of the Trinity Divide is relatively low and heavily forested, and until very recently 7.5' topographic quadrangles were not available for it. It is crisscrossed by old logging and mining roads and Jeep trails, and by relatively random wandering on them it is possible to encounter unusual habitats, including the *Ledum* bog at Horse Heaven, the *Darlingtonia* bog at Crow Creek, and the tufa exposure at Asbestos Gulch, all of which produced important records. The Crow Creek *Euphyes vestris* connect the previously-known and isolated colonies at Scott Mountain Summit and Mount Shasta City, and suggest that many other colonies of this very local skipper may exist in the region. *Carterocephalus palaemon* was previously unrecorded in the Trinity Divide. The many species collected at Horse Heaven and elsewhere in the vicinity document the ecological breadth which allows them to transcend the edaphic and vegetational complexity of northern California; the montane fauna is much more eurytopic than the sub-alpine and alpine. At least one species enters the eastern fringe of the Trinity Divide, but fails to extend more than about 6 km west of Interstate 5. This is the apparent *Lycaena editha* Mead — *L. xanthoides* Bdv. intergrade, which is common at Dunsmuir and extends locally westward along the Callahan-Gazelle Road, but is otherwise absent from the Trinities and Eddies. Its distribution does not correlate very well with climate or vegetation.

The Asbestos Gulch series of *Hesperia*, embracing as much variation as occurs in the entire region, includes specimens which if taken out of context could be called three different subspecies. One wonders how many taxonomic decisions have been predicated on such small and unrepresentative samples!

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